

SMART CHOICE! SERIES

10 step guide

to choosing the right

PORTABLE RADIO



Choosing the proper radios affects:

- The safety of your staff
- Your team's effectiveness
- Profitability

That's why Icom makes a wide range of radios. Use this guide to help choose the features you need while remaining affordable and cost-effective. *Let's get started!*

RADIOS FOR PEOPLE WHO MAKE SMART CHOICES

**ICOM**[®]

STEP 2: MEMORY CHANNELS & SCANNING

Number of memory channels

The number of channels varies from 4, 16, 128, 250 and 512 by model. Simple applications need a few channels; more complex schemes require more channels. Store your frequencies in many combinations of operating parameters (i.e. power, signaling, scan, etc). Store frequencies you use in other locations. Store frequencies to be used during shared response to incidents in various locations, etc.

Dynamic bank configuration/scan

Eight memory channel banks. Assign any quantity of memory channels to a bank for "partitioning" multiple channels into clearly defined groups. Example: "Bank 1" is EMT, "Bank 2" is FD District 4, etc. Tactical Group Function Allows you to copy memory channels into a new memory zone without using PC programming to construct a temporary work group on site for working with inter-organization groups, in large scale disasters (i.e. hurricane, flood, etc.)

Display

A visual display is helpful when navigating your channel scheme. Allows entry of upper and lower case

characters for easy channel bank tag identification. It also shows all the operating status of your radio. As in other devices you may own, a visual display is a useful item.

Scan

Similar to your car radio, it scans the designated memory channels for radio traffic, stops to listen, and resumes scan unless you answer. If you work with multiple channels, you need the scan feature.

Priority scan

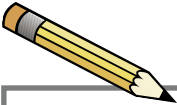
Channel or Frequency checking of an assigned channel. A great feature, when a highly important frequency needs to be continually checked for activity. Users can assign two channels as priority channel on some radios.

Priority (home) channel

Enables instant access to either of the 2 priority (home) channels regardless of memory location.

Busy channel lockout

Disables transmitter from use to prohibit transmission if the channel is in a muted state, busy, and/or when a CTCSS tone is received unmatched.



Feature	Required
Minimum channels	<input type="radio"/>
4	<input type="radio"/>
16	<input type="radio"/>
128	<input type="radio"/>
250	<input type="radio"/>
256	<input type="radio"/>
512	<input type="radio"/>
Display	<input type="radio"/>
Dual Priority Scan	<input type="radio"/>

STEP 3: PERFORMANCE

Antenna

Antenna length is selected to maximize range. For a small degradation in performance, you may select “stubby antennas”; more compact in appearance. Make sure your antenna is removable; not all are.

Audio quality

The combination of robust audio circuitry and a good speaker provides crisp, clear audio.

Compander

Improves audio clarity in new “narrow band” frequencies.

Battery

Easy to remove, back-mounted batteries provide stronger construction. Lithium-Ion (Li-ion) technology is recognized as the best, providing high capacity, long life, no “memory effect”, no conditioning required, no recycling, no full discharge before charging and all in a smaller size. The battery capacity determines how long you can use it between charges. Select a bigger battery if you plan to transmit more than you receive. For stand-by or receive, a smaller battery is fine.

Power saver

Prolongs operating time by “resting” the battery for tiny increments between transmissions. Hardly noticeable during operation, but the battery life could be doubled.

Specifications

Operational design specifications of sensitivity, selectivity, intermodulation, and adjacent channel interference. All radios are not the same!

Power

The transmit output power of the radio (measured in watts). May range from 1 to 5 watts. Range and clarity may generally be improved by increasing power. Some radios permit selection of L-M-H power by the user to prolong battery life.

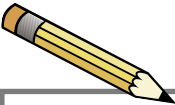
Battery types

Ni-Cd – Good when long life, heavy use, and extended temperature range is important. Can experience charging problems.

Ni-MH – Better performance/weight ratio than Ni-Cd. No toxic metals. Can experience charging problems.

Li-ion – Newer and popular; high energy density and low weight. Very reliable and easy to use. Easy charging. Less than half the size of a same capacity Ni-Cd.

Alkaline – Low load = low transmit power, but a long shelf life. Great for emergency storage or backup.



Feature	Required	Optional	N/A
BTL Audio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compander	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Li-Ion Battery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High Bid Specs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

STEP 4: CUSTOM OPERATIONS

Internal option slots

Some radios have 1-2 plug-in receptacles which enable optional functions much like your computer (encryption, trunking, etc.)

Programmable keys

Your dealer can customize your radio by assigning functions important to you to programmable keys.

User set mode

Allows user to adjust backlighting level, function beep on/off, squelch level, mic gain, and power on battery voltage indicator – Gives the user front panel squelch adjust key

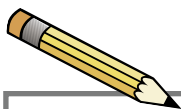
Flash memory

Radios with flash memory may be upgraded with new features and improvements with simple firmware upgrades in the future.

ANI—Automatic Number Identification encode function allows radio to send unique identification with each transmission, to other radio users, or to a dispatcher. ANI Decode function allows other radio users to easily identify on the display of the radio, who is making each radio transmission.



Most Icom radios have 1 or 2 internal option slots. These allow for a variety of increased radio functions, like trunking or encrypted messages.



Feature	Required	Optional	N/A
Internal option slots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Flash memory	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



STEP 5: SPECTRUM

Operating frequency range

The operational band width of the radio (measured in MHz). Wide band width enables utilization of multiple frequencies even if far apart (especially important for interoperability with other systems or locations). VHF and UHF offer different propagation advantages.

Licensed vs. unlicensed

The FCC licenses the number of users sharing each frequency to ensure availability of the channel and minimize radio traffic jams. Unlicensed frequencies are crowded, open for all to

hear, with no limit or regulation of radio traffic. OK for a family outing but not for your critical communications. Make sure your radio can be programmed to licensed frequencies.

Channel spacing

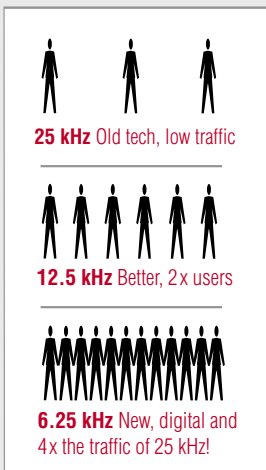
The width of each signal (measured in kHz). The FCC has mandated narrow band operation (12.5 kHz) in the future. You must have that capability now. Older systems operate on 25 kHz; you need both in your radio to talk to them. Icom also has certified products that operate on 6.25 kHz channel width.

Radio spectrum use

It's a fact of nature: there's only so much radio spectrum that everyone must share. In the U.S.A., how we use that spectrum is decided and

enforced by the FCC. The FCC splits the airwaves up into channels. The number of channels is set by the FCC, based on what technology will allow. Why is that important? Read on:

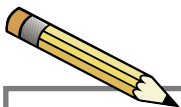
Radio channels (spectrum efficiency)



25 kHz channel spacing is the traditional technology many radios (mostly older, analog units) still rely on. The FCC is in the process of eliminating 25 kHz channel spacing.

12.5 kHz allows double the number of users within the same amount of spectrum, and is how many radios now operate. Nearly all Icom radios offer 25 or 12.5 kHz operation, all within the same radio!

6.25 kHz is the coming future of channel spacing that's here today, allowing four times as many users. This involves digital technology, which allows crisp, clear data and voice signals (no static!). Only Icom has 25/12.5/6.25 kHz radios today!



Feature

136-174, VHF
146-174, VHF
400-450, UHF
450-512, UHF
440-470, UHF

Required

STEP 6: OPERATION MODES

Talk around

Provides direct, mobile-to-mobile communications, avoiding needless repeater use and congestion – Also provides direct communications when out of range of repeater system

Operating modes

Most radios have traditional “conventional” operation (one channel operation at a time) while others have “trunking” capability (simultaneous multiple channel operation). Trunking enables 3-4 times the number of users to maximize the utilization of your licensed channels. They require a trunking enabled repeater and some feature seamless roaming from site to site.

The most popular analog trunking protocols are LTR®, PassPort®, and SmartTrunk®. All Icom radios offer at least one version of trunking, and most offer multiple versions - all within the same radio, selectable by channel.



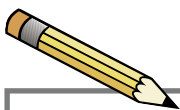
Analog vs. digital

Most radios use traditional analog signals. Like the cellular industry, 2-way radios are moving toward digital technology. Some radios permit both digital and analog operation now (dual mode), and some have upgrade capability should you desire to in the future. A popular standard is “APCO 25” (note the P25 logo) for interoperability with Federal, State and Local Government agencies.

VOX (Voice Operated Transmit)

Voice Operated Transmit permits transmissions without pressing the transmit button.

Take advantage of hands-free operation with an optional VOX headset.



Feature	Required	Optional	N/A
FDMA 6.25 kHz	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital Mode			
P25 Mode	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunking - LTR®	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunking - PassPort®	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Trunking - SmartTrunk®	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

STEP 7: SIGNALING

Signaling

Transmits signals (some audible, some not) simultaneously with your voice to control how other radios receive your transmission and how you receive theirs. May also ID who is talking, who is receiving, control the operational status of the fleet radios, send data for GPS positioning or text messaging, etc. Several technologies are available. Your radio should have as many as possible for future flexibility.

Signaling encode/decode

Some radios can receive signals (decode), some can generate signals (encode), and some do both.

MDC 1200 signaling

Digital signaling for advanced Operations. Features like Selective Calling, Automatic Identification, Call Alert, Emergency Call with ID, Status Display, Message Display, Stun/Revive, and Radio Check are included. MDC 1200 is widely used, so Icom radios with this capability merge into your fleet easily.

CTCSS/DCS basic signaling

Enables compatibility with existing CTCSS & DCS based systems. Selective individual and group calling are possible with. Excellent for isolating a call to a specific user without needlessly alerting others.

2-tone / 5-tone advanced signaling

More advanced signaling to accomplish many functions. Some radios can receive from 1 to 10 combinations per memory channel; not limited to industry standard 2-tone tables. Enables multiple groups on the same channel (no scan or channel switch necessary). Also enables alerts, alarms, and other useful functions.

DTMF signaling

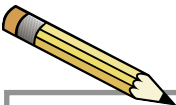
The same sound you hear when pressing a touch tone phone, used to control transmit & receive signals.

A.N.I.

An excellent feature for public safety, plant security, and any A.N.I. application where it is essential to identify the user during transmission. Use DTMF and numerous 5-tone formats. User can also customize their own A.N.I.



Some Icom radios have LCD displays that allow for complex text messaging. The display can be programmed to show words, numbers, phrases – even customized icons.



Feature	Required	Optional	N/A
MDC 1200	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DTMF	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ANI	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

STEP 8: SAFETY



Intrinsically safe (I.S.)

Special models which have been tested and certified by Factory Mutual (note the FM logo) for safe operation in explosive or flammable environments.

Emergency call

The radio can transmit an emergency ID message, showing the unit number,

and may repeat that emergency status message until cancelled, and the emergency is under control. Essential for public safety and plant security, as well as in any hazardous, high-risk area (i.e. retail).

Man down alarm

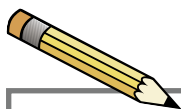
Auto transmits an emergency call if the radio is horizontal for a pre-programmed period of time. Good to have where people work alone in hazardous conditions and may not be able to call for help if incapacitated (or held prisoner).



More advanced Icom radios are equipped with a press-and-hold emergency button. It's an essential feature for many radio applications.

Man down

The man down feature is a real safety feature for sole operators in potentially dangerous situations. It automatically sends an emergency signal when the transceiver is left in the horizontal position for a pre-set time.



Feature	Required	Optional	N/A
IS (FM)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Emergency Call	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Man Down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

STEP 9: SECURITY

Stun/Kill

Remote disabling of radio in the event of unauthorized use or theft. Excellent for maintaining communication integrity with minimal disruption.

Encryption

All radios may be heard with a simple radio scanner. Protect your sensitive information with encryption (similar to a WI-FI key) so the transmission is intelligible to your people only. What's the value of your transmitted information?

Time Out Timer (TOT)

Disables transmitter if the radio is accidentally keyed, or if a user gets too "long-winded", tying up the frequency beyond normal use. Can also be locked out for a programmable period of time following time out.

Transmit inhibit

Disables transmitter from use to prohibit transmission if the selected channel is a "receive only" channel. Perfect for monitoring NOAA "weather" broadcasts.

Levels of security

Icom provides different levels of security to meet your needs.

UT-109–Inversion

Simple voice inversion scrambler with up to 32 codes.

UT-110–Rolling Code

Rolling code scrambler with up to 1020 codes (255 codes x4 groups)

DES 20–Maximum Security

Provides protection against the most determined and technically capable listeners.

Digital DES–OFB–P25 Secure

56 bit encryption.

Digital AES–P25 Maximum Security

256 bit encryption offers maximum security.



Feature	Required	Optional
Stun/Kill	<input type="radio"/>	<input type="radio"/>
Encryption - Inversion	<input type="radio"/>	<input type="radio"/>
Encryption- Rolling Code	<input type="radio"/>	<input type="radio"/>
Encryption - Analog DES	<input type="radio"/>	<input type="radio"/>
Encryption - Digital DES	<input type="radio"/>	<input type="radio"/>
Encryption - Digital AES	<input type="radio"/>	<input type="radio"/>

STEP 10: OTHER CONSIDERATIONS

Warranty

The length of time the original manufacturer warranties the radio. Some warranties may be extended for a modest additional cost, to ensure peace of mind against unexpected disruption or expense well into the future.

Imbedded Electronic Serial Number (ESN)

Prevents loss/theft by utilizing hard coded ESN that is encoded by the Icom factory. There is no way to change ESN (even by Icom factory). This improves security by identifying radio through permanent ESN.

Technical support

Ability of the manufacturer to support implantation, training and customization.

Accessories

Specific applications may be enhanced with speaker mics, chargers, carrying cases, headsets, etc.

Complete radio systems

Does the manufacturer offer the design and installation of complete on-site communications systems totally independent of the public power and communications grids? Icom America Systems does!

Value or price

Price and value are important.

"Price" is the amount of money you will pay. If this is most important to you, choose the lowest cost Icom radio that best meets your needs.

"Value" is how much you get for your money. An upper tier Icom radio, with more capabilities than higher priced competitive models, may offer your best "value". More for less!

Icom offers both "price" and "value" propositions depending on your needs.



Feature	Required
2 Year Warranty	<input type="radio"/>
3 Year Warranty	<input type="radio"/>
4 Year Warranty	<input type="radio"/>
5 Year Warranty	<input type="radio"/>

Congratulations!

Now that you've identified what you need in a radio, it's time to make the simple selection of which model is right for you.

Please proceed to the portable radio comparison chart.